

## AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

### Listing of Claims:

Claim 1 (currently amended): An integral, substantially air impermeable polymeric membrane for use in an electrochemical apparatus or process comprising:

- a) a polymeric sheet comprising polymer and having a porous structure with a microstructure of nodes and fibrils and an interior volume of said porous structure between the nodes and fibrils,
- b) the polymeric sheet having distributed in the polymer nodes and fibrils of the polymeric sheet:
  - i) metal;
  - ii) an organic polymer; or
  - iii) a combination thereof, and
- c) said interior volume of said porous structure comprising a porosity of the polymeric sheet of greater than 35% and being at least partially filled with substantially occluded by an ion-exchange resin to provide ionic conductance for use in the electrochemical apparatus or process

~~wherein an interior volume of the porous structure of the polymeric sheet is substantially occluded by the ion-exchange resin.~~

Claim 2 (cancelled).

Claim 3 (original): The membrane of claim 1 wherein the polymeric sheet has distributed therein a precious metal.

Claim 4 (cancelled).

Claim 5 (currently amended): An integral, substantially air impermeable polymeric membrane for use in an electrochemical apparatus or process comprising:

- a) a polymeric sheet comprising polymer and having a porous structure with a microstructure of nodes and fibrils and an interior volume of the porous structure between the nodes and fibrils,
- b) fumed silica the polymeric sheet having distributed in the polymer nodes and fibrils of the polymeric sheet:
  - i) inorganic particulate;
  - ii) metal;
  - iii) an organic polymer; or
  - iv) a combination thereof, and

c) ~~said porous structure being at least partially filled with electrolyte substantially occluding said interior volume of said porous structure to provide ionic conductance for use in the electrochemical apparatus or process,~~

~~wherein the polymeric sheet has distributed therein fumed silica, and an interior volume of the porous structure of the polymeric sheet is substantially occluded by the electrolyte.~~

Claim 6 (original): The membrane of claim 1 wherein the polymeric sheet has distributed therein titania.

Claim 7 (cancelled).

Claim 8 (original): The membrane of claim 1 wherein the polymeric sheet has distributed therein platinum.

Claim 9 (original): The membrane of claim 1 wherein the polymeric sheet has distributed therein platinum supported on a substrate.

Claim 10 (currently amended): A polymeric membrane for use in an electrochemical apparatus or process comprising:

a) a polymeric sheet comprising polymer and having a porous structure with a microstructure of nodes and fibrils and an interior volume between the nodes and fibrils,

b) the polymeric sheet having distributed in the polymer nodes and fibrils:

i) metal;

ii) an organic polymer; or

iii) a combination thereof, and

c) [[an]] said interior volume of said porous structure is substantially occluded by an ion-exchange resin to provide ionic conductance for use in the electrochemical apparatus or process,

wherein the polymeric sheet is expanded porous PTFE.

Claim 11 (cancelled).

Claim 12 (original): The membrane of claim 1, wherein the polymeric sheet has metal distributed therein.

Claim 13 (original): The membrane of claim 1, wherein the polymeric sheet has an organic polymer distributed therein.

Claim 14 (original): The membrane of claim 1, wherein the polymeric sheet has a thickness of less than 50 microns.

Claim 15 (original): The membrane of claim 1, wherein the membrane is disposed between two fuel cell electrodes.

Claim 16 (canceled).

Claim 17 (previously presented): The membrane of claim 15, wherein the polymeric sheet has a thickness of less than 38 microns, and wherein the

membrane that is disposed between said two electrodes of a fuel cell provides a steady state current of at least 1.78 amps/cm<sup>2</sup> at 0.5 volts, with no humidification of incoming fuel cell air and hydrogen reactants, with air and hydrogen feed both at 40 psig and 25°C, and the fuel cell temperature at 50°C.

Claims 18-23 (cancelled).

Claim 24 (previously presented): The membrane of claim 1, wherein said ion-exchange resin is fluorinated.

Claim 25 (previously presented): The membrane of claim 14, wherein the polymeric sheet has a thickness between 13 microns and 50 microns.

Claim 26 (cancelled).

Claim 27 (previously presented): The polymeric membrane of claim 1 in which the polymeric sheet comprises a porous polymeric film; and the ion exchange resin is a polymer different from the polymeric film.

Claim 28 (currently amended): The polymeric membrane of claim 1 in which said interior volume of said porous structure comprises a porosity of the polymeric sheet [[has]] comprises a porosity of the polymeric sheet of 40% to 95%.

Claim 29 (currently amended): The polymeric membrane of claim 1 in which said interior volume of said porous structure comprises a porosity of the polymeric sheet [[has]] comprises a porosity of 70% to 95%.

Claim 30 (previously presented): The polymeric membrane of claim 1 in which the polymeric sheet comprises an expanded porous PTFE film having substantially fibrils with substantially no nodes present.

Claim 31 (cancelled).